AN ESTIMATE OF THE MIGRATORY TIMING AND ABUNDANCE OF SOCKEYE SALMON INTO UPPER COOK INLET, ALASKA, IN 2000

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ABSTRACT

A test fishery was conducted during the 2000 Upper Cook Inlet commercial salmon fishery. The primary objectives were to estimate the abundance and run-timing of the sockeye salmon *Oncorhynchus nerka* return as it passed a transect located along the southern boundary of the management area. Three in-season estimates of the total sockeye salmon return were determined. The test fishery operated from 1-July to 30-July and captured 2,364 sockeye salmon representing 1,520 CPUE points. The mean date of the run was 13-July, and the test fishery encompassed approximately 96.3% of the total run.

KEY WORDS: Salmon, *Oncorhynchus*, Upper Cook Inlet, Alaska, test fishery, migratory behavior

INTRODUCTION

In 1979 the Alaska Department of Fish and Game (ADF&G) began a test fishing project near the southern boundary of the Upper Cook Inlet (UCI) salmon management area (Figure1). The objective of this project was to estimate the total run of sockeye salmon *Oncorhynchus nerka* returning to UCI before these fish reached commercial harvest areas. These data are extremely important to ADF&G management biologists as they set and adjust commercial fishing times and areas to most effectively harvest sockeye salmon that are surplus to spawning needs. Test fishing results have been reported annually since 1979 (Waltemyer 1983a, 1983b, 1986a, 1986b, Hilsinger and Waltemyer 1987, Hilsinger 1988, Tarbox and Waltemyer 1989, Tarbox 1990, 1992, 1994, 1995, 1996, 1997, 1998a, 1998b, 1999). This report presents the results of the 2000 test-fishing project.

METHODS

Test Fishing

Sockeye salmon returning to Upper Cook Inlet were sampled by fishing geographically fixed stations between Anchor Point and Red River Delta (Figure 1). Stations were numbered consecutively from east to west, with station locations being determined from LORAN C coordinates. A chartered test-fishing vessel sampled stations 4 - 8 daily, traveling east to west on odd-numbered days and west to east on even-numbered days.

Sampling started on 1 July and continued through 30 July. The chartered vessel, *F/V Corrina Kay*, fished 366 m (1,200 ft) of 2.1 cm (5 1/8 in) multi-filament gillnet during test fishing. The drift gillnet web had a filament size number of 53/S6F, was 45 meshes deep, and was constructed of double knot Super Crystal shade number 1.

All salmon captured were identified to species and sex and were measured for fork length (mid-eye to fork-of-tail in mm). The number of fish caught at each station was expressed as a catch per unit of effort (CPUE) statistic for each species:

$$CPUE_S = \frac{100 fm \ x \ 60 \min \ x \ number\ of fish}{fm\ of\ gear \ x \ MFT} \qquad (1)$$

where: $CPUE_s$ = CPUE for station s, and
MFT = mean fishing time.

Mean fishing time was calculated as:

$$MFT = (C - B) + \frac{(B - A) + (D - C)}{2} \quad (2)$$

where: A = time net deployment started,
B = time net fully deployed,
C = time net retrieval started, and
D = time net fully retrieved.

Once deployed at a station, gillnets were fished 30 min before retrieval started.

Daily CPUE ($CPUE_d$) was calculated as:

$$CPUE_d = \sum_{s=1}^{n} CPUE_s \quad (3)$$

The following physical and chemical measurements were taken at the start of each set: air temperature, water temperature (at 1 m below the surface), wind velocity and direction, tide stage, water depth, and water clarity. Air and water temperatures were measured using a YSI salinity/temperature meter. Wind speed was measured in knots and direction was recorded as 0 (no wind), 1 (north), 2 (northeast), 3 (east), 4 (southeast), 5 (south), 6 (southwest), 7 (west), or 8 (northwest). Tide stage was classed as flood, ebb or slack by observing the movement of the vessel while drifting with the gill net. Water depth was measured in fm using a Simrad echo sounder, and water clarity was measured in m using a 17.5 cm secchi disk.

Describing the Salmon Migration

Catchability, the fraction of the available population taken by a defined unit of fishing effort, was estimated as:

$$q_d = {}^{c_d}\!/_{r_d} \quad (4)$$

where: q_d = estimated catchability on day d,
r_d = adjusted cumulative total return on day d, and
c_d = cumulative CPUE on day d.

Passage rate, the expansion factor used to convert CPUE into estimated numbers of salmon passing the test fishing transect, was calculated as:

$$PR = 1/q_d \tag{5}$$

Since the test fishery did not encompass the entire sockeye salmon run, the total CPUE for the test fishery was estimated after the season using the following relationships:

$$CPUE_t = CPUE_f \; x \; \frac{H_t}{H_{(f+2)}} \tag{6}$$

where: $CPUE_t$ = total estimated CPUE for the season,
$CPUE_f$ = cumulative CPUE through final day, f, of test fishing,
H_t = total commercial harvest for the season
$H_{(f+2)}$ = total commercial catch through final day of test fishery (f+2), and
2 = number of days it took salmon to travel from test fishery to commercial harvest areas.

$$CPUE_t = CPUE_f \; x \; \frac{E_t}{E_{(cd+2)} + E_{(nd+4)}} \tag{7}$$

where: $CPUE_t$ = total estimated CPUE for the season,
$CPUE_f$ = cumulative CPUE through final day, f, of test fishing,
E_t = total escapement for the season
$E_{(cd+2)}$ = total escapement through final day of test fishery (f+2) in the central district
$E_{(nd+4)}$ = total escapement through final day of test fishery (f+2) in the northern district
2, 4 = number of days it took salmon to travel from test fishery to spawning steams

Estimates of $CPUE_t$ and $CPUE_d$ values were used to estimate daily and cumulative proportions of $CPUE_t$, based on a non-linear model:

$$y_d = 1/(1 = e^{-(a + bd)}) \tag{8}$$

where: y_d = cumulative proportion of CPUE or return on day d,
a and b = coefficients of model,
d = day of observation.

To calculate mean date of return (M), the following formula was used:

$$M = a/b \tag{9}$$

RESULTS AND DISCUSSION

A total of 2,364 sockeye salmon, 908 pink salmon *O. gorbuscha*, 1,031 chum salmon *O. keta*, 1,157 coho salmon *O. kisutch*, and 2 chinook salmon *O. tshawytscha*, were captured during the 2000 test fishery (Table 1, Appendices A-D). Daily sockeye salmon catches ranged from 3 to 303 fish (Table 1).

Sockeye salmon daily CPUE values ranged from 2.5 on 28 July to 151 on 9 July. Cumulative total CPUE for the duration of the project was 1,520 (Table 1). Using post season commercial harvest figures, test fishing spanned approximately 99.3% of the total run. Therefore, the total CPUE for the test fishery would have been 1,531 if test fishing had continued throughout the duration of the run. However, due to the significant number of commercial fishery restrictions that occurred during the latter part of July, it was not appropriate to estimate the portion of the run that the test fishery encompassed based solely on commercial catches. A second estimate was made using a combination of commercial harvest and escapement (see formula 7). Based upon the combined catch and escapement figures, the test fishery encompassed 96.3% of the run. Using this figure, the cumulative test fishery CPUE would have been 1,578.

Sockeye salmon catches along the transect were similar to the distribution of CPUE values (Tables 2 and 3).

Examination of daily and cumulative proportions (estimated post season) of the sockeye salmon run to UCI suggested that 5.2% of the run had passed the transect prior to the start of test fishing on 1 July and that the run was 98.5% completed at project termination (Appendix E; Figure 2). The mean date of the run was 13 July, which was two days early relative to the historic average (Table 4).

The total sockeye salmon run to UCI in 1999 was estimated to be 2.9 million fish of which 1.327 million were harvested in the commercial fishery. Estimated passage rate for the season was 1,850 sockeye salmon per CPUE index point.

Water temperatures measured along the transect were 9-10° C early in July and then warmed to a high of 11.4 C toward to the end of July (Appendix F). Air temperatures fluctuated between 12°C and 18°C during the project (Appendix F). Wind velocities were of average intensity and quite variable in direction for most of the season. Of particular interest, however, is the fact that the two

windiest days of the month coincided with the two regular scheduled fishing periods where the largest harvest of sockeye salmon took place. The harsh conditions were largely to blame for the poor quality of fish sold to processors, as these fish received a pounding in the surf prior to being picked from nets. Numerous commercial fishermen reported to the ADF&G Soldotna office that these two periods were some of the roughest they recalled ever having fished in UCI.

During the commercial salmon fishing season, three estimates of the sockeye salmon total run were completed (Appendix G). The first estimate was made on 17 July. The passage rate estimate was 1,846 sockeye salmon per index point. The best fit was 1991 with a total CPUE estimate of 2,560 for a total return estimate of 4.73 million fish. The second estimate was made following the commercial fishery of 20 July. Passage rate and total sockeye salmon CPUE were estimated at 2,674 and 1,891, respectively, based upon the entry pattern of the best fit, which had changed to 1987. The total return was estimated at 5.1 million fish. The next best fit of the 20 July data followed the 1996 entry pattern timing and estimated a total return of 3.2 million fish. On 24 July a total return estimate of 3.1 million fish was made using a total cumulative CPUE estimate of 1,639 and a passage rate estimate of 1,907. Again, the 1996 entry pattern was determined to be the best fit to the current year's data.

The 2000 season was fairly uncharacteristic in that the return of sockeye salmon to Upper Cook Inlet was early and weak. The peak daily OTF CPUE occurred on July 9 and projections of the year-end cumulative CPUE, made by fitting the current year's data to past years' run curves, continued to decline from mid-month on. There was no strength to the "tail" of the run, i.e., before the end of July, the sockeye salmon return to Upper Cook Inlet was nearly complete. The poor return resulted in numerous commercial fishing restrictions, and when combined with the low price fishermen received for their catches, the ex-vessel value from this year's fishery made it one of the least valuable in the past 20 years.

Because the return to Upper Cook Inlet was two days early and weak, and also because the commercial fishery was significantly restricted, the July 20th prediction was the last date that commercial harvest data could be used to calculate passage rates. As in other years, the second best fit from early predictions turned out to be the best fit by year's end. Nevertheless, the offshore test fish program was a critical tool to forewarn managers of the weak return. And, the July 20th prediction of a total return of 3.2 million sockeye salmon was very close to the actual return of 2.9 million.

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Table 1. Summary of sockeye salmon fishing effort, daily and cumulative catch, and daily and cumulative CPUE, Upper Cook Inlet offshore test fish project, 2000.

Date	Number of Stations	Mean Fishing Time (min)	CATCH		CPUE		Mean Length (mm)
			Daily	Cum	Daily	Cum	
1-Jul	6	214.5	48	48	41.6	41.6	535
2-Jul	6	220.0	36	84	28.6	70.2	543
3-Jul	6	217.5	7	91	5.8	76.0	565
4-Jul	6	226.0	47	138	35.1	111.1	550
5-Jul	6	227.0	75	213	56.7	167.9	543
6-Jul	6	226.5	72	285	54.1	222.0	548
7-Jul	6	222.5	38	323	29.2	251.2	559
8-Jul	6	219.5	15	338	12.0	263.1	559
9-Jul	6	258.0	303	641	151.0	414.1	581
10-Jul	6	257.0	246	887	134.1	548.2	557
11-Jul	6	239.5	199	1086	141.4	689.6	584
12-Jul	6	247.5	180	1266	98.2	787.8	584
13-Jul	6	257.5	190	1456	118.8	906.6	573
14-Jul	6	223.0	50	1506	38.0	944.6	563
15-Jul	6	225.0	18	1524	14.3	958.9	563
16-Jul	6	245.5	174	1698	114.0	1072.9	567
17-Jul	6	271.5	121	1819	76.5	1149.4	571
18-Jul	6	251.0	73	1892	45.8	1195.2	575
19-Jul	6	254.0	111	2003	67.3	1262.4	577
20-Jul	6	229.5	50	2053	34.5	1296.9	573
21-Jul	6	249.0	88	2141	57.1	1354.0	576
22-Jul	6	236.5	60	2201	43.5	1397.4	574
23-Jul	6	247.0	60	2261	40.3	1437.7	572
24-Jul	6	201.0	18	2279	14.2	1451.9	577
25-Jul	6	214.5	3	2282	2.8	1454.7	562
26-Jul	6	216.5	11	2293	8.9	1463.6	576
27-Jul	6	226.0	27	2320	21.0	1484.6	568
28-Jul	6	210.0	3	2323	2.5	1487.1	572
29-Jul	6	224.0	24	2347	18.7	1505.8	584
30-Jul	6	209.5	17	2364	14.5	1520.3	573

Table 2 Estimated sockeye salmon catch by date and station, Upper Cook Inlet offshore test fish project 2000.

	Station Number						
Date	4	5	6	6.5	7	8	Total
1-Jul	1	33	0	0	13	1	48
2-Jul	5	5	18	1	0	7	36
3-Jul	0	5	0	0	2	0	7
4-Jul	1	10	20	8	5	3	47
5-Jul	0	2	29	2	36	6	75
6-Jul	1	42	22	1	6	0	72
7-Jul	1	1	27	4	4	1	38
8-Jul	0	0	10	0	5	0	15
9-Jul	3	3	45	250	1	1	303
10-Jul	3	10	26	191	14	2	246
11-Jul	13	0	44	91	50	1	199
12-Jul	0	3	162	12	3	0	180
13-Jul	1	67	33	75	9	5	190
14-Jul	8	32	0	6	1	3	50
15-Jul	0	3	4	9	0	2	18
16-Jul	0	0	39	19	29	87	174
17-Jul	1	38	21	41	18	2	121
18-Jul	2	14	37	16	4	0	73
19-Jul	0	4	34	26	47	0	111
20-Jul	0	2	0	32	15	1	50
21-Jul	0	7	4	9	34	34	88
22-Jul	0	3	22	18	4	13	60
23-Jul	1	15	28	13	2	1	60
24-Jul	0	1	1	14	1	1	18
25-Jul	0	1	0	1	1	0	3
26-Jul	3	2	0	1	5	0	11
27-Jul	1	5	1	0	11	9	27
28-Jul	0	2	1	0	0	0	3
29-Jul	0	9	0	4	5	6	24
30-Jul	0	0	2	2	7	6	17
TOTAL	45	319	630	846	332	192	2,364
%	1.9	13.5	26.6	35.8	14.0	8.1	100.0

Table 3. Estimated sockeye salmon CPUE by date and station, Upper Cook Inlet offshore test fish project, 2000.

	Station Number						
Date	4	5	6	6.5	7	8	Total
1-Jul	0.8	29.6	0.0	0.0	10.4	0.9	41.6
2-Jul	4.2	4.1	13.8	0.8	0.0	5.7	28.6
3-Jul	0.0	4.1	0.0	0.0	1.7	0.0	5.8
4-Jul	0.8	7.9	15.2	6.4	2.4	2.5	35.1
5-Jul	0.0	1.7	21.0	1.6	27.7	4.8	56.7
6-Jul	0.8	30.4	17.1	0.8	5.0	0.0	54.1
7-Jul	0.8	0.8	20.3	3.2	3.2	0.8	29.2
8-Jul	0.0	0.0	7.9	0.0	4.1	0.0	12.0
9-Jul	2.5	2.3	31.8	112.8	0.8	0.8	151.0
10-Jul	2.4	8.1	25.7	85.6	10.6	1.7	134.1
11-Jul	10.3	0.0	29.4	56.9	44.1	0.8	141.4
12-Jul	0.0	2.3	85.2	8.2	2.5	0.0	98.2
13-Jul	0.8	40.6	23.6	42.8	6.9	4.1	118.8
14-Jul	6.3	23.4	0.0	4.9	0.9	2.5	38.0
15-Jul	0.0	2.4	3.0	7.3	0.0	1.7	14.3
16-Jul	0.0	0.0	27.3	13.9	19.6	53.2	114.0
17-Jul	0.8	26.8	11.1	25.1	11.1	1.6	76.5
18-Jul	1.7	10.3	19.7	11.0	3.2	0.0	45.8
19-Jul	0.0	2.8	20.3	16.8	27.4	0.0	67.3
20-Jul	0.0	1.7	0.0	21.1	10.9	0.9	34.5
21-Jul	0.0	5.5	3.2	7.0	20.8	20.6	57.1
22-Jul	0.0	2.3	14.8	13.7	3.2	9.4	43.5
23-Jul	0.8	10.2	18.1	8.8	1.6	0.8	40.3
24-Jul	0.0	1.2	1.1	10.3	0.8	0.9	14.2
25-Jul	0.0	1.1	0.0	0.8	0.9	0.0	2.8
26-Jul	2.4	1.6	0.0	0.9	4.0	0.0	8.9
27-Jul	0.8	4.2	0.8	0.0	8.4	6.8	21.0
28-Jul	0.0	1.7	0.9	0.0	0.0	0.0	2.5
29-Jul	0.0	6.8	0.0	3.2	3.8	4.9	18.7
30-Jul	0.0	0.0	1.7	1.7	5.8	5.2	14.5
TOTAL	36.2	233.8	412.7	465.5	241.6	130.5	1520.3
%	2.4	15.4	27.1	30.6	15.9	8.6	100

Table 4. Mean date of the sockeye salmon run across Anchor Point transect, Upper Cook Inlet offshore test fish project, 1979-2000.

Year	Mean Date[a]	
	Coded	Calendar
1979	18.4	11-Jul
1980	22.7	15-Jul
1981	13.2	6-Jul
1982	24.2	17-Jul
1983	22.6	15-Jul
1984	18.4	11-Jul
1985	22.7	15-Jul
1986	23.0	16-Jul
1987	25.7	18-Jul
1988	20.6	13-Jul
1989	21.6	14-Jul
1990	25.6	18-Jul
1991	24.3	17-Jul
1992	24.3	17-Jul
1993	21.4	14-Jul
1994	26.2	19-Jul
1995	22.1	15-Jul
1996	20.4	13-Jul
1997	23.6	16-Jul
1998	24.9	18-Jul
1999	24.4	18-Jul
2000	19.9	13-Jul
1979-1999	22.4	15-Jul

[a] Day (1) = June 24.

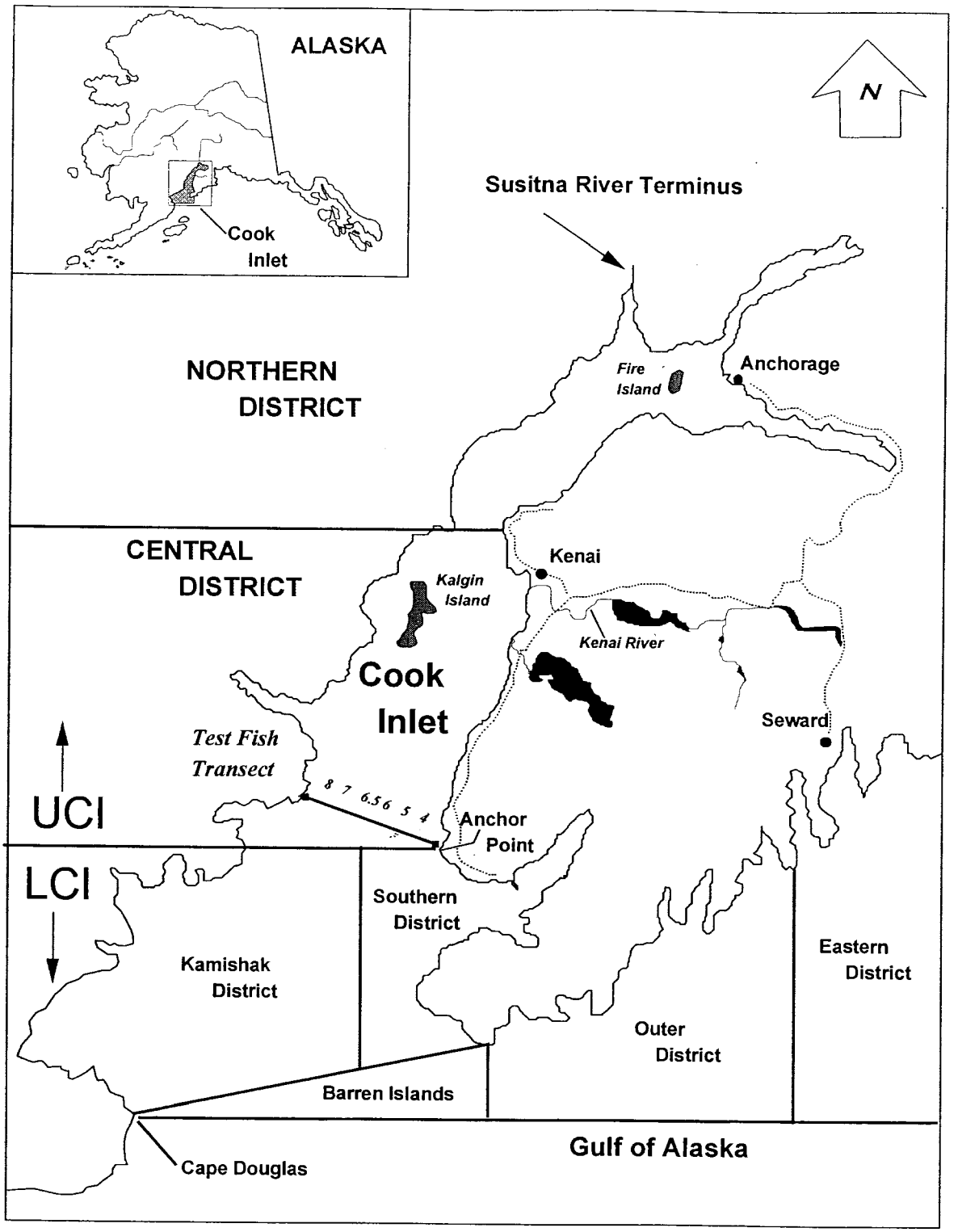

Figure 1. Location of fishing districts and offshore test fish transect in Cook Inlet, Alaska, 2000.

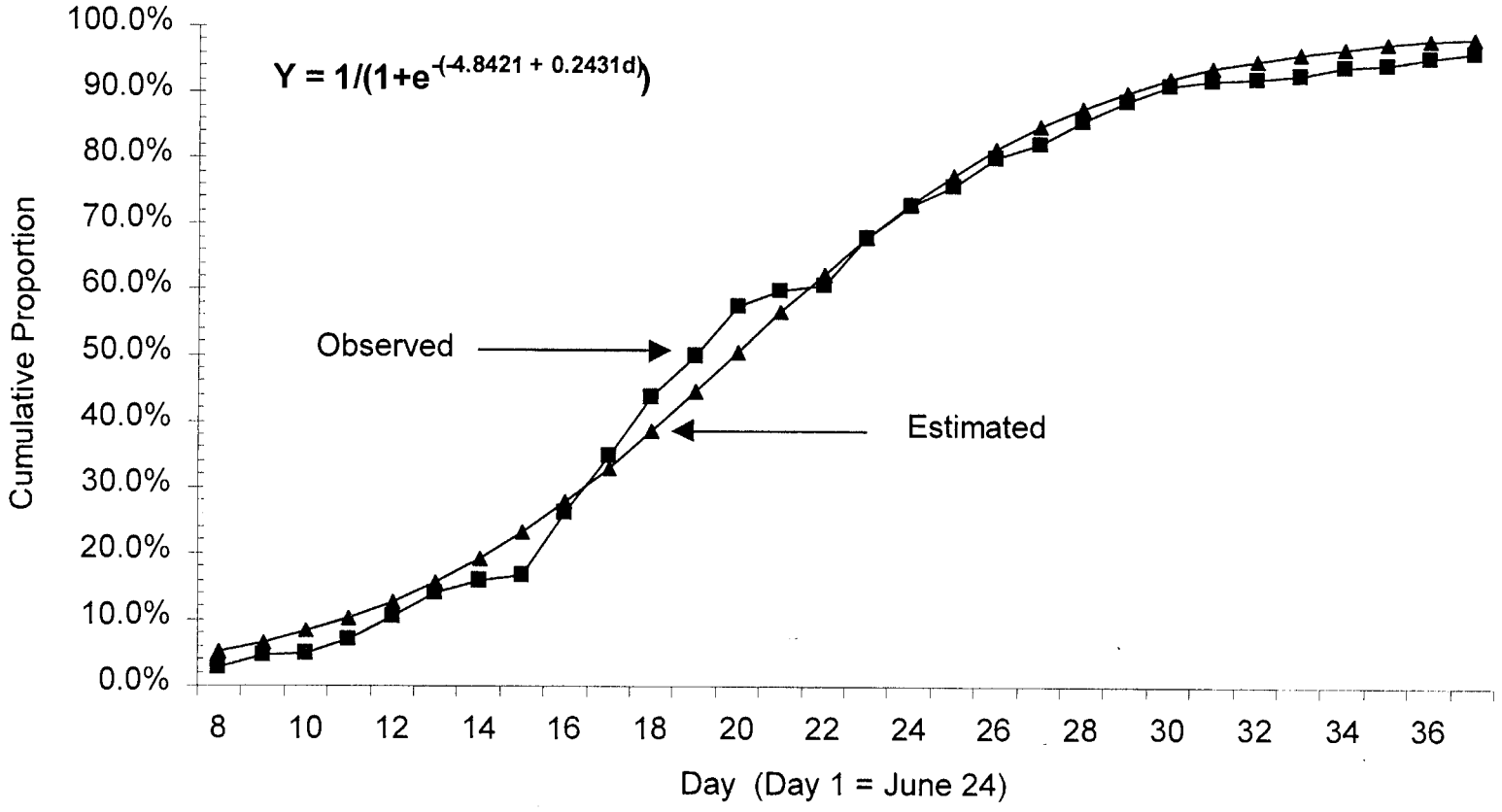

Figure 2. Cumulative proportions estimated for the sockeye salmon return to Upper Cook Inlet, Alaska 2000.

Appendix A1. Summary of pink salmon fishing effort, daily and cumulative catch, and daily and cumulative CPUE, Upper Cook Inlet offshore test fish project, 2000.

Date	Number of Stations	Mean Fishing Time (min)	CATCH		CPUE	
			Daily	Cum	Daily	Cum
1-Jul	6	214.5	0	0	0.0	0.0
2-Jul	6	220.0	0	0	0.0	0.0
3-Jul	6	217.5	0	0	0.0	0.0
4-Jul	6	226.0	0	0	0.0	0.0
5-Jul	6	227.0	1	1	0.7	0.7
6-Jul	6	226.5	0	1	0.0	0.7
7-Jul	6	222.5	0	1	0.0	0.7
8-Jul	6	219.5	1	2	0.8	1.5
9-Jul	6	258.0	1	3	0.7	2.2
10-Jul	6	257.0	2	5	1.6	3.9
11-Jul	6	239.5	0	5	0.0	3.9
12-Jul	6	247.5	1	6	0.5	4.4
13-Jul	6	257.5	6	12	3.5	7.9
14-Jul	6	223.0	3	15	2.3	10.2
15-Jul	6	225.0	3	18	2.3	12.4
16-Jul	6	245.5	29	47	19.7	32.1
17-Jul	6	271.5	51	98	30.2	62.3
18-Jul	6	251.0	186	284	118.1	180.5
19-Jul	6	254.0	192	476	120.5	301.0
20-Jul	6	229.5	27	503	18.9	319.9
21-Jul	6	249.0	132	635	83.9	403.8
22-Jul	6	236.5	38	673	27.4	431.2
23-Jul	6	247.0	85	758	57.7	488.9
24-Jul	6	201.0	22	780	16.7	505.6
25-Jul	6	214.5	15	795	13.1	518.7
26-Jul	6	216.5	37	832	29.7	548.4
27-Jul	6	226.0	42	874	32.7	581.0
28-Jul	6	210.0	1	875	0.8	581.9
29-Jul	6	224.0	29	904	22.2	604.1
30-Jul	6	209.5	4	908	3.4	607.5

Appendix A2. Estimated pink salmon catch by date and station, Upper Cook Inlet offshore test fish project 2000.

	Station Number						
Date	4	5	6	6.5	7	8	Total
1-Jul	0	0	0	0	0	0	0
2-Jul	0	0	0	0	0	0	0
3-Jul	0	0	0	0	0	0	0
4-Jul	0	0	0	0	0	0	0
5-Jul	0	0	1	0	0	0	1
6-Jul	0	0	0	0	0	0	0
7-Jul	0	0	0	0	0	0	0
8-Jul	0	0	0	0	1	0	1
9-Jul	0	0	1	0	0	0	1
10-Jul	1	0	0	0	0	1	2
11-Jul	0	0	0	0	0	0	0
12-Jul	0	0	1	0	0	0	1
13-Jul	0	2	0	4	0	0	6
14-Jul	1	2	0	0	0	0	3
15-Jul	0	0	2	1	0	0	3
16-Jul	0	0	3	8	11	7	29
17-Jul	0	13	26	5	7	0	51
18-Jul	0	55	85	36	10	0	186
19-Jul	0	18	21	58	95	0	192
20-Jul	1	0	0	11	15	0	27
21-Jul	3	9	1	7	49	63	132
22-Jul	0	7	16	0	4	11	38
23-Jul	2	39	18	23	3	0	85
24-Jul	3	0	0	17	2	0	22
25-Jul	10	3	0	1	1	0	15
26-Jul	8	6	0	1	22	0	37
27-Jul	0	0	15	3	18	6	42
28-Jul	0	1	0	0	0	0	1
29-Jul	1	3	0	6	18	1	29
30-Jul	0	2	1	1	0	0	4
TOTAL	30	160	191	182	256	89	908
%	3	18	21	20	28	10	100

Appendix A3. Estimated pink salmon CPUE by date and station, Upper Cook Inlet offshore test fish project, 2000.

	Station Number						
Date	4	5	6	6.5	7	8	Total
1-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-Jul	0.0	0.0	0.7	0.0	0.0	0.0	0.7
6-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-Jul	0.0	0.0	0.0	0.0	0.8	0.0	0.8
9-Jul	0.0	0.0	0.7	0.0	0.0	0.0	0.7
10-Jul	0.8	0.0	0.0	0.0	0.0	0.8	1.6
11-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Jul	0.0	0.0	0.5	0.0	0.0	0.0	0.5
13-Jul	0.0	1.2	0.0	2.3	0.0	0.0	3.5
14-Jul	0.8	1.5	0.0	0.0	0.0	0.0	2.3
15-Jul	0.0	0.0	1.5	0.8	0.0	0.0	2.3
16-Jul	0.0	0.0	2.1	5.9	7.4	4.3	19.7
17-Jul	0.0	9.2	13.7	3.1	4.3	0.0	30.2
18-Jul	0.0	40.3	45.1	24.8	7.9	0.0	118.1
19-Jul	0.0	12.7	15.0	37.4	55.4	0.0	120.5
20-Jul	0.8	0.0	0.0	7.3	10.9	0.0	18.9
21-Jul	2.5	7.0	0.8	5.5	30.0	38.2	83.9
22-Jul	0.0	5.5	10.8	0.0	3.2	8.0	27.4
23-Jul	1.6	26.6	11.6	15.5	2.4	0.0	57.7
24-Jul	2.5	0.0	0.0	12.4	1.7	0.0	16.7
25-Jul	8.0	3.4	0.0	0.8	0.9	0.0	13.1
26-Jul	6.5	4.9	0.0	0.9	17.4	0.0	29.7
27-Jul	0.0	0.0	12.2	2.3	13.7	4.6	32.7
28-Jul	0.0	0.8	0.0	0.0	0.0	0.0	0.8
29-Jul	0.9	2.3	0.0	4.8	13.5	0.8	22.2
30-Jul	0.0	1.7	0.9	0.9	0.0	0.0	3.4
TOTAL	24.4	117.1	115.6	124.5	169.4	56.6	607.5
%	4.0	19.3	19.0	20.5	27.9	9.3	100.0

Appendix B1. Summary of chum salmon fishing effort, daily and cumulative catch, and daily and cumulative CPUE, Upper Cook Inlet offshore test fish project, 2000.

Date	Number of Stations	Mean Fishing Time (min)	CATCH		CPUE	
			Daily	Cum	Daily	Cum
1-Jul	6	214.5	2	2	1.7	1.7
2-Jul	6	220.0	4	6	3.2	4.9
3-Jul	6	217.5	2	8	1.6	6.6
4-Jul	6	226.0	8	16	6.3	12.8
5-Jul	6	227.0	19	35	14.1	26.9
6-Jul	6	226.5	6	41	4.6	31.4
7-Jul	6	222.5	11	52	8.3	39.7
8-Jul	6	219.5	13	65	10.4	50.1
9-Jul	6	258.0	84	149	43.7	93.7
10-Jul	6	257.0	28	177	18.0	111.7
11-Jul	6	239.5	63	240	43.8	155.5
12-Jul	6	247.5	31	271	18.9	174.4
13-Jul	6	257.5	76	347	47.6	222.0
14-Jul	6	223.0	14	361	11.0	233.0
15-Jul	6	225.0	6	367	4.8	237.8
16-Jul	6	245.5	30	397	20.8	258.6
17-Jul	6	271.5	204	601	116.8	375.4
18-Jul	6	251.0	43	644	26.2	401.6
19-Jul	6	254.0	67	711	41.9	443.5
20-Jul	6	229.5	46	757	31.3	474.8
21-Jul	6	249.0	62	819	39.9	514.7
22-Jul	6	236.5	53	872	38.8	553.5
23-Jul	6	247.0	60	932	40.3	593.8
24-Jul	6	201.0	11	943	8.2	601.9
25-Jul	6	214.5	9	952	8.5	610.4
26-Jul	6	216.5	12	964	9.6	620.1
27-Jul	6	226.0	50	1014	38.1	658.2
28-Jul	6	210.0	1	1015	0.9	659.0
29-Jul	6	224.0	10	1025	7.8	666.8
30-Jul	6	209.5	6	1031	5.1	671.9

Appendix B2. Estimated pink salmon catch by date and station, Upper Cook Inlet offshore test fish project 2000.

	Station Number						
Date	4	5	6	6.5	7	8	Total
1-Jul	1	1	0	0	0	0	2
2-Jul	1	1	1	0	0	1	4
3-Jul	0	2	0	0	0	0	2
4-Jul	1	3	3	1	0	0	8
5-Jul	0	0	12	0	7	0	19
6-Jul	1	2	3	0	0	0	6
7-Jul	0	0	11	0	0	0	11
8-Jul	0	0	10	0	2	1	13
9-Jul	3	7	8	65	0	1	84
10-Jul	0	2	7	16	3	0	28
11-Jul	1	3	5	40	14	0	63
12-Jul	1	1	18	11	0	0	31
13-Jul	1	21	17	33	3	1	76
14-Jul	10	2	0	1	0	1	14
15-Jul	1	2	1	0	0	2	6
16-Jul	0	0	5	12	9	4	30
17-Jul	0	6	102	78	18	0	204
18-Jul	0	2	27	7	6	1	43
19-Jul	0	0	6	29	31	1	67
20-Jul	0	1	0	32	13	0	46
21-Jul	1	3	0	16	26	16	62
22-Jul	0	22	24	2	4	1	53
23-Jul	2	7	39	7	1	4	60
24-Jul	0	0	0	10	1	0	11
25-Jul	0	3	2	1	1	2	9
26-Jul	5	2	0	0	5	0	12
27-Jul	0	1	2	11	14	22	50
28-Jul	0	0	0	1	0	0	1
29-Jul	0	3	1	0	4	2	10
30-Jul	0	0	6	0	0	0	6
TOTAL	29	97	310	373	162	60	1031
%	2.8	9.4	30.1	36.2	15.7	5.8	100.0

Appendix B3. Estimated chum salmon CPUE by date and station, Upper Cook Inlet offshore test fish project, 2000.

	Station Number						
Date	4	5	6	6.5	7	8	Total
1-Jul	0.8	0.9	0.0	0.0	0.0	0.0	1.7
2-Jul	0.8	0.8	0.8	0.0	0.0	0.8	3.2
3-Jul	0.0	1.6	0.0	0.0	0.0	0.0	1.6
4-Jul	0.8	2.4	2.3	0.8	0.0	0.0	6.3
5-Jul	0.0	0.0	8.7	0.0	5.4	0.0	14.1
6-Jul	0.8	1.5	2.3	0.0	0.0	0.0	4.6
7-Jul	0.0	0.0	8.3	0.0	0.0	0.0	8.3
8-Jul	0.0	0.0	7.9	0.0	1.6	0.9	10.4
9-Jul	2.5	5.4	5.7	29.3	0.0	0.8	43.7
10-Jul	0.0	1.6	6.9	7.2	2.3	0.0	18.0
11-Jul	0.8	2.3	3.3	25.0	12.4	0.0	43.8
12-Jul	1.1	0.8	9.5	7.5	0.0	0.0	18.9
13-Jul	0.8	12.7	12.1	18.8	2.3	0.8	47.6
14-Jul	7.9	1.5	0.0	0.8	0.0	0.8	11.0
15-Jul	0.8	1.6	0.7	0.0	0.0	1.7	4.8
16-Jul	0.0	0.0	3.5	8.8	6.1	2.5	20.8
17-Jul	0.0	4.2	53.7	47.7	11.1	0.0	116.8
18-Jul	0.0	1.5	14.3	4.8	4.7	0.8	26.2
19-Jul	0.0	0.0	4.3	18.7	18.1	0.8	41.9
20-Jul	0.0	0.8	0.0	21.1	9.4	0.0	31.3
21-Jul	0.8	2.3	0.0	11.7	15.3	9.7	39.9
22-Jul	0.0	17.1	16.2	1.5	3.2	0.7	38.8
23-Jul	1.6	4.8	25.2	4.7	0.8	3.3	40.3
24-Jul	0.0	0.0	0.0	7.3	0.8	0.0	8.2
25-Jul	0.0	3.4	1.7	0.8	0.9	1.7	8.5
26-Jul	4.1	1.6	0.0	0.0	4.0	0.0	9.6
27-Jul	0.0	0.8	1.6	8.4	10.6	16.7	38.1
28-Jul	0.0	0.0	0.0	0.9	0.0	0.0	0.9
29-Jul	0.0	2.3	0.8	0.0	3.0	1.6	7.8
30-Jul	0.0	0.0	5.1	0.0	0.0	0.0	5.1
TOTAL	23.6	72.0	194.9	225.9	112.0	43.6	671.9
%	3.5	10.7	29.0	33.6	16.7	6.5	100.0

Appendix C1. Summary of coho salmon fishing effort, daily and cumulative catch, and daily and cumulative CPUE, Upper Cook Inlet offshore test fish project, 2000.

Date	Number of Stations	Mean Fishing Time (min)	CATCH		CPUE	
			Daily	Cum	Daily	Cum
1-Jul	6	214.5	1	1	0.9	0.9
2-Jul	6	220.0	1	2	0.8	1.7
3-Jul	6	217.5	0	2	0.0	1.7
4-Jul	6	226.0	8	10	6.2	7.8
5-Jul	6	227.0	9	19	6.8	14.6
6-Jul	6	226.5	5	24	3.7	18.3
7-Jul	6	222.5	4	28	3.1	21.4
8-Jul	6	219.5	2	30	1.6	23.0
9-Jul	6	258.0	44	74	22.2	45.1
10-Jul	6	257.0	78	152	47.0	92.1
11-Jul	6	239.5	37	189	27.7	119.8
12-Jul	6	247.5	85	274	54.3	174.1
13-Jul	6	257.5	99	373	63.2	237.3
14-Jul	6	223.0	28	401	22.1	259.4
15-Jul	6	225.0	42	443	32.0	291.4
16-Jul	6	245.5	84	527	56.2	347.6
17-Jul	6	271.5	174	701	102.3	450.0
18-Jul	6	251.0	55	756	33.7	483.7
19-Jul	6	254.0	51	807	33.2	516.9
20-Jul	6	229.5	65	872	45.0	561.9
21-Jul	6	249.0	58	930	36.7	598.6
22-Jul	6	236.5	57	987	40.6	639.1
23-Jul	6	247.0	86	1073	58.0	697.1
24-Jul	6	201.0	13	1086	10.7	707.8
25-Jul	6	214.5	1	1087	0.9	708.7
26-Jul	6	216.5	7	1094	5.6	714.3
27-Jul	6	226.0	32	1126	26.8	741.1
28-Jul	6	210.0	9	1135	7.6	748.7
29-Jul	6	224.0	16	1151	12.5	761.2
30-Jul	6	209.5	6	1157	5.1	766.3

Appendix C2. Estimated coho salmon catch by date and station, Upper Cook Inlet offshore test fish project 2000.

	Station Number						
Date	4	5	6	6.5	7	8	Total
1-Jul	0	0	0	0	0	1	1
2-Jul	0	1	0	0	0	0	1
3-Jul	0	0	0	0	0	0	0
4-Jul	0	0	6	1	1	0	8
5-Jul	0	0	3	0	6	0	9
6-Jul	0	3	2	0	0	0	5
7-Jul	0	0	3	1	0	0	4
8-Jul	0	0	2	0	0	0	2
9-Jul	0	3	1	37	3	0	44
10-Jul	0	2	14	50	12	0	78
11-Jul	0	13	6	9	9	0	37
12-Jul	0	8	30	45	2	0	85
13-Jul	8	12	12	54	11	2	99
14-Jul	21	3	2	1	1	0	28
15-Jul	0	9	27	3	3	0	42
16-Jul	0	0	3	24	27	30	84
17-Jul	0	2	63	56	49	4	174
18-Jul	1	2	35	8	4	5	55
19-Jul	0	11	6	21	13	0	51
20-Jul	0	1	0	37	26	1	65
21-Jul	0	7	0	1	32	18	58
22-Jul	0	2	23	3	3	26	57
23-Jul	0	24	29	28	4	1	86
24-Jul	0	0	2	7	1	3	13
25-Jul	0	0	1	0	0	0	1
26-Jul	1	2	0	0	4	0	7
27-Jul	0	1	3	8	6	14	32
28-Jul	0	1	0	7	1	0	9
29-Jul	1	5	0	7	2	1	16
30-Jul	0	1	1	0	3	1	6
TOTAL	32.0	113.0	274.0	408.0	223.0	107.0	1157.0
%	2.8	9.8	23.7	35.3	19.3	9.2	100.0

Appendix C3. Estimated coho salmon CPUE by date and station, Upper Cook Inlet offshore test fish project, 2000.

	Station Number						
Date	4	5	6	6.5	7	8	Total
1-Jul	0.0	0.0	0.0	0.0	0.0	0.9	0.9
2-Jul	0.0	0.8	0.0	0.0	0.0	0.0	0.8
3-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4-Jul	0.0	0.0	4.6	0.8	0.8	0.0	6.2
5-Jul	0.0	0.0	2.2	0.0	4.6	0.0	6.8
6-Jul	0.0	2.2	1.6	0.0	0.0	0.0	3.7
7-Jul	0.0	0.0	2.3	0.8	0.0	0.0	3.1
8-Jul	0.0	0.0	1.6	0.0	0.0	0.0	1.6
9-Jul	0.0	2.3	0.7	16.7	2.5	0.0	22.2
10-Jul	0.0	1.6	13.8	22.4	9.1	0.0	47.0
11-Jul	0.0	10.1	4.0	5.6	7.9	0.0	27.7
12-Jul	0.0	6.2	15.8	30.7	1.6	0.0	54.3
13-Jul	6.4	7.3	8.6	30.8	8.5	1.6	63.2
14-Jul	16.6	2.2	1.7	0.8	0.9	0.0	22.1
15-Jul	0.0	7.1	20.0	2.4	2.5	0.0	32.0
16-Jul	0.0	0.0	2.1	17.6	18.2	18.4	56.2
17-Jul	0.0	1.4	33.1	34.3	30.3	3.2	102.3
18-Jul	0.8	1.5	18.6	5.5	3.2	4.2	33.7
19-Jul	0.0	7.8	4.3	13.6	7.6	0.0	33.2
20-Jul	0.0	0.8	0.0	24.4	18.9	0.9	45.0
21-Jul	0.0	5.5	0.0	0.8	19.6	10.9	36.7
22-Jul	0.0	1.6	15.5	2.3	2.4	18.8	40.6
23-Jul	0.0	16.4	18.7	18.9	3.2	0.8	58.0
24-Jul	0.0	0.0	2.2	5.1	0.8	2.5	10.7
25-Jul	0.0	0.0	0.9	0.0	0.0	0.0	0.9
26-Jul	0.8	1.6	0.0	0.0	3.2	0.0	5.6
27-Jul	0.0	0.8	2.4	8.4	4.6	10.6	26.8
28-Jul	0.0	0.8	0.0	5.9	0.9	0.0	7.6
29-Jul	0.9	3.8	0.0	5.5	1.5	0.8	12.5
30-Jul	0.0	0.9	0.9	0.0	2.5	0.9	5.1
TOTAL	25.5	82.6	175.4	253.2	155.1	74.5	766.3
%	3.3	10.8	22.9	33.0	20.2	9.7	100.0

Appendix D1. Summary of chinook salmon fishing effort, daily and cumulative catch, and daily and cumulative CPUE, Upper Cook Inlet offshore test fish project, 2000.

Date	Number of Stations	Mean Fishing Time (min)	CATCH		CPUE	
			Daily	Cum	Daily	Cum
1-Jul	6	214.5	1	1	0.8	0.8
2-Jul	6	220.0	0	1	0.0	0.8
3-Jul	6	217.5	0	1	0.0	0.8
4-Jul	6	226.0	0	1	0.0	0.8
5-Jul	6	227.0	0	1	0.0	0.8
6-Jul	6	226.5	0	1	0.0	0.8
7-Jul	6	222.5	0	1	0.0	0.8
8-Jul	6	219.5	0	1	0.0	0.8
9-Jul	6	258.0	0	1	0.0	0.8
10-Jul	6	257.0	0	1	0.0	0.8
11-Jul	6	239.5	1	2	0.6	1.4
12-Jul	6	247.5	0	2	0.0	1.4
13-Jul	6	257.5	0	2	0.0	1.4
14-Jul	6	223.0	0	2	0.0	1.4
15-Jul	6	225.0	0	2	0.0	1.4
16-Jul	6	245.5	0	2	0.0	1.4
17-Jul	6	271.5	0	2	0.0	1.4
18-Jul	6	251.0	0	2	0.0	1.4
19-Jul	6	254.0	0	2	0.0	1.4
20-Jul	6	229.5	0	2	0.0	1.4
21-Jul	6	249.0	0	2	0.0	1.4
22-Jul	6	236.5	0	2	0.0	1.4
23-Jul	6	247.0	0	2	0.0	1.4
24-Jul	6	201.0	0	2	0.0	1.4
25-Jul	6	214.5	0	2	0.0	1.4
26-Jul	6	216.5	0	2	0.0	1.4
27-Jul	6	226.0	0	2	0.0	1.4
28-Jul	6	210.0	0	2	0.0	1.4
29-Jul	6	224.0	0	2	0.0	1.4
30-Jul	6	209.5	0	2	0.0	1.4

Appendix D2. Estimated chinook salmon catch by date and station, Upper Cook Inlet offshore test fish project 2000.

	Station Number						
Date	4	5	6	6.5	7	8	Total
1-Jul	0	0	0	0	1	0	1
2-Jul	0	0	0	0	0	0	0
3-Jul	0	0	0	0	0	0	0
4-Jul	0	0	0	0	0	0	0
5-Jul	0	0	0	0	0	0	0
6-Jul	0	0	0	0	0	0	0
7-Jul	0	0	0	0	0	0	0
8-Jul	0	0	0	0	0	0	0
9-Jul	0	0	0	0	0	0	0
10-Jul	0	0	0	0	0	0	0
11-Jul	0	0	0	1	0	0	1
12-Jul	0	0	0	0	0	0	0
13-Jul	0	0	0	0	0	0	0
14-Jul	0	0	0	0	0	0	0
15-Jul	0	0	0	0	0	0	0
16-Jul	0	0	0	0	0	0	0
17-Jul	0	0	0	0	0	0	0
18-Jul	0	0	0	0	0	0	0
19-Jul	0	0	0	0	0	0	0
20-Jul	0	0	0	0	0	0	0
21-Jul	0	0	0	0	0	0	0
22-Jul	0	0	0	0	0	0	0
23-Jul	0	0	0	0	0	0	0
24-Jul	0	0	0	0	0	0	0
25-Jul	0	0	0	0	0	0	0
26-Jul	0	0	0	0	0	0	0
27-Jul	0	0	0	0	0	0	0
28-Jul	0	0	0	0	0	0	0
29-Jul	0	0	0	0	0	0	0
30-Jul	0	0	0	0	0	0	0
TOTAL	0.0	0.0	0.0	1.0	1.0	0.0	2.0
%	0.0	0.0	0.0	50.0	50.0	0.0	100.0

Appendix D3. Estimated chinook salmon CPUE by date and station, Upper Cook Inlet offshore test fish project, 2000.

Date	Station Number						Total
	4	5	6	6.5	7	8	
1-Jul	0.0	0.0	0.0	0.0	0.8	0.0	0.8
2-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-Jul	0.0	0.0	0.0	0.6	0.0	0.0	0.6
12-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.6	0.8	0.0	1.4
%	0.0	0.0	0.0	44.1	55.9	0.0	100.0

Appendix E1. Entry pattern of sockeye salmon into Upper Cook Inlet, Alaska, 2000 estimated from daily CPUE measured at the latitude of Anchor Point.

Day	Date	Input y	Estimated y	Residual	Change in Input Y	Change in estimated Y
8	1-Jul	0.0264	0.0523	-0.0259		
9	2-Jul	0.0445	0.0657	-0.0212	0.0181	0.0134
10	3-Jul	0.0482	0.0823	-0.0342	0.0037	0.0166
11	4-Jul	0.0704	0.1027	-0.0322	0.0223	0.0203
12	5-Jul	0.1064	0.1273	-0.0209	0.0360	0.0247
13	6-Jul	0.1407	0.1569	-0.0162	0.0343	0.0295
14	7-Jul	0.1592	0.1918	-0.0326	0.0185	0.0349
15	8-Jul	0.1667	0.2323	-0.0655	0.0076	0.0405
16	9-Jul	0.2624	0.2784	-0.0160	0.0957	0.0461
17	10-Jul	0.3474	0.3297	0.0176	0.0850	0.0514
18	11-Jul	0.4370	0.3855	0.0515	0.0896	0.0558
19	12-Jul	0.4992	0.4445	0.0548	0.0622	0.0589
20	13-Jul	0.5745	0.5050	0.0695	0.0753	0.0605
21	14-Jul	0.5986	0.5654	0.0332	0.0241	0.0604
22	15-Jul	0.6077	0.6239	-0.0163	0.0091	0.0585
23	16-Jul	0.6799	0.6790	0.0009	0.0722	0.0551
24	17-Jul	0.7284	0.7296	-0.0012	0.0485	0.0505
25	18-Jul	0.7574	0.7748	-0.0174	0.0290	0.0452
26	19-Jul	0.8000	0.8144	-0.0143	0.0426	0.0396
27	20-Jul	0.8219	0.8483	-0.0265	0.0218	0.0340
28	21-Jul	0.8580	0.8771	-0.0190	0.0362	0.0287
29	22-Jul	0.8856	0.9010	-0.0154	0.0275	0.0239
30	23-Jul	0.9111	0.9206	-0.0095	0.0255	0.0197
31	24-Jul	0.9201	0.9367	-0.0166	0.0090	0.0160
32	25-Jul	0.9219	0.9497	-0.0278	0.0018	0.0130
33	26-Jul	0.9275	0.9601	-0.0326	0.0056	0.0104
34	27-Jul	0.9408	0.9684	-0.0276	0.0133	0.0083
35	28-Jul	0.9424	0.9751	-0.0327	0.0016	0.0066
36	29-Jul	0.9542	0.9803	-0.0261	0.0118	0.0053
37	30-Jul	0.9634	0.9845	-0.0211	0.0092	0.0042

Appendix F. Chemical and physical observations made in Upper Cook Inlet, Alaska during the conduct of the 2000 offshore test fish project.

Date	Station	Air Temp (c)	Water Temp (c)	Wind Vel. (knots)	Wind Dir	Tide Stage	Salinity (ppt)	Water Depth (f)	Secchi (m)
1-Jul	4	17	9.1	10	southeast	ebb	31.8	23.5	6.5
	5	17	8.5	8	southeast	low	31.9	44	5.5
	6	15	9.3	5	south	flood	30.9	42	3.8
	6.5	14	9.4	5	south	flood	30.8	41	3.0
	7	13	9.6	10	south	flood	30.3	43	2.5
	8	12	9.3	12	southeast	flood	30.8	30.3	2.0
2-Jul	8	10	9.4	18	south	ebb	30.8	30	2.5
	7	14	9.4	18	south	ebb	30.6	43	2.8
	6.5	14	9.7	22	south	ebb	30.3	43	3.0
	6	11	9.6	18	south	ebb	30.6	45	3.0
	5	11	9.1	18	southwest	low	31.3	36	4.5
	4	14	9.2	10	southwest	flood	31.6	23.7	5.0
3-Jul	4	12	9.2	20	southeast	ebb	31.7	23	5.0
	5	12	9.5	18	south	ebb	31.0	38	4.0
	6	13	9.8	15	south	ebb	30.5	45	2.0
	6.5	12	9.7	15	south	low	30.5	41	2.0
	7	12	9.9	10	south	flood	30.2	40	1.5
	8	12	9.7	15	south	flood	30.5	30	2.0
4-Jul	8	11	9.6	15	southeast	high	30.7	21	2.0
	7	11	9.6	22	southeast	ebb	30.6	44	3.0
	6.5	12	9.6	23	southeast	ebb	30.6	43	3.0
	6	12	9.6	20	southeast	ebb	30.7	45	4.0
	5	12	9.5	20	southeast	ebb	31.1	37	4.0
	4	12	8.9	18	southeast	ebb	31.9	22	16.0
5-Jul	4	17	8.9	7	south	ebb	31.9	23	11.0
	5	14	10.2	15	southwest	ebb	30.7	36	6.0
	6	15	10.6	18	southwest	ebb	30.0	43	2.5
	6.5	14	10.8	15	southwest	low	29.7	42	2.0
	7	15	11.5	15	southwest	flood	29.2	42	2.0
	8	13	10.7	10	southwest	flood	30.1	29	2.0
6-Jul	8	12	10.2	4	southeast	flood	30.1	29	2.0
	7	12	10.0	5	southeast	flood	30.6	45	3.5
	6.5	11	9.7	10	southeast	flood	31.0	45	4.5
	6	11	9.5	12	southeast	high	31.1	48	6.0
	5	13	9.5	15	southeast	ebb	31.2	35	7.0
	4	15	9.5	12	southeast	ebb	31.7	22	12.0

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Appendix F. (p 2 of 5)

Date	Station	Air Temp (c)	Water Temp (c)	Wind Vel. (knots)	Wind Dir	Tide Stage	Salinity (ppt)	Water Depth (f)	Secchi (m)
7-Jul	4	12	9.1	11	southeast	ebb	31.6	23	11.0
	5	11	10.0	15	south	ebb	30.8	37	5.0
	6	12	10.5	15	southwest	ebb	29.9	45	2.5
	6.5	13	10.5	18	southwest	ebb	29.9	42	2.5
	7	12	10.6	18	southwest	low	29.9	43	2.0
	8	12	10.5	15	southwest	flood	30.0	29	1.5
8-Jul	8	11	10.4	10	southwest	flood	30.0	29	1.5
	7	11	10.5	5	south	flood	29.9	43	2.0
	6.5	13	10.5	5	south	flood	30.0	42	3.0
	6	12	10.4	5	south	flood	30.0	48	3.0
	5	12	9.4	5	south	flood	31.3	37	8.0
	4	14	9.0	0	none	flood	31.8	25	12.0
9-Jul	4	15	9.5	0	none	flood	31.9	26	14.0
	5	14	9.9	10	southwest	high	31.1	43	7.0
	6	16	10.8	10	southwest	ebb	29.9	50	4.0
	6.5	13	11.1	15	southwest	ebb	29.9	47	3.0
	7	15	10.9	20	southwest	ebb	29.8	43	3.0
	8	13	10.7	10	south	low	30.0	28	3.0
10-Jul	8	12	10.4	15	southeast	ebb	30.1	28	2.0
	7	11	11.2	15	southeast	low	29.0	44	2.0
	6.5	13	11.3	15	southeast	flood	28.7	41	3.0
	6	11	10.9	15	south	flood	29.6	45	3.0
	5	11	9.7	5	south	flood	31.1	37	8.0
	4	12	9.4	10	southeast	high	31.6	25	11.0
11-Jul	4	12	9.7	10	southeast	flood	31.3	25	7.5
	5	12	9.8	8	southeast	flood	31.1	40	7.0
	6	14	11.8	5	south	flood	28.9	47	4.5
	6.5	14	11.9	5	south	flood	28.9	42	3.0
	7	15	11.4	10	south	high	29.1	42	3.0
	8	15	12.4	5	south	ebb	29.8	28	2.0
12-Jul	8	13	10.9	13	southeast	ebb	29.7	29	2.5
	7	12	10.9	15	southeast	ebb	29.6	43	3.0
	6.5	13	12.0	15	southeast	ebb	28.9	40	3.0
	6	13	11.6	10	southeast	flood	28.8	46	3.0
	5	14	9.9	15	southeast	flood	31.2	37	7.0
	4	14	9.6	10	southeast	flood	31.5	25	10.0

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Appendix F. (p 3 of 5)

Date	Station	Air Temp (c)	Water Temp (c)	Wind Vel. (knots)	Wind Dir	Tide Stage	Salinity (ppt)	Water Depth (f)	Secchi (m)
13-Jul	4	13	10.8	30	southeast	low	29.0	23	5.0
	5	13	11.5	30	south	flood	29.1	36	5.0
	6	14	11.6	25	south	flood	28.9	48	4.0
	6.5	14	11.2	25	southwest	flood	29.0	45	3.0
	7	15	11.6	25	southwest	ebb	28.9	45	2.0
	8	15	11.2	25	southwest	ebb	29.4	24	2.0
14-Jul	8	14	11.0	22	southwest	ebb	29.9	28	2.0
	7	12	10.9	18	southwest	ebb	29.8	44	3.0
	6.5	12	10.9	15	southwest	ebb	29.7	43	3.0
	6	13	11.4	12	southwest	ebb	28.8	45	3.0
	5	14	11.6	10	southwest	low	28.5	35	4.0
	4	14	10.6	10	southwest	flood	30.6	25	5.0
15-Jul	4	13	10.1	4	northeast	low	31.2	23	6.0
	5	13	10.2	5	northeast	flood	30.8	35	6.0
	6	13	10.5	2	northeast	flood	30.3	47	4.0
	6.5	16	10.3	7	northeast	flood	30.4	43	4.0
	7	15	11.5	10	north	flood	28.8	43	4.0
	8	18	11.9	10	northeast	flood	29.5	32	3.0
16-Jul	8	12	11.0	25	northwest	ebb	29.4	31	2.5
	7	13	10.7	18	northwest	ebb	29.8	44	3.0
	6.5	13	10.7	15	north	ebb	29.8	42	3.5
	6	14	10.5	10	north	ebb	30.2	44	3.5
	5	14	10.0	8	north	flood	31.1	36	7.0
	4	14	10.2	0	none	flood	31.3	24	12.0
17-Jul	4	14	10.3	25	south	ebb	31.2	23	7.0
	5	14	11.1	20	south	ebb	29.2	36	5.0
	6	14	11.5	20	south	low	28.8	44	4.0
	6.5	13	11.4	30	south	flood	29.1	45	3.0
	7	14	11.1	27	south	flood	29.5	42	3.0
	8	13	11.0	38	southwest	flood	29.7	29	1.5
18-Jul	8	12	10.9	17	southeast	high	29.6	31	2.0
	7	12	10.6	24	southeast	ebb	29.9	44	2.5
	6.5	13	10.7	25	southeast	ebb	29.9	43	3.5
	6	13	10.6	28	southeast	ebb	30.0	46	4.0
	5	13	10.8	15	southeast	ebb	29.9	31	4.0
	4	13	9.8	12	southeast	low	31.6	23	9.0

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Appendix F. (p 4 of 5)

Date	Station	Air Temp (c)	Water Temp (c)	Wind Vel. (knots)	Wind Dir	Tide Stage	Salinity (ppt)	Water Depth (f)	Secchi (m)
19-Jul	4	13	10.1	4	southeast	ebb	31.7	22	9.0
	5	15	10.6	5	southeast	low	30.5	34.6	6.0
	6	16	10.7	5	southwest	flood	30.2	46	4.5
	6.5	18	10.8	8	southwest	flood	30.3	41	4.0
	7	14	10.2	5	southwest	flood	30.2	43	3.5
	8	16	10.7	8	southwest	flood	29.9	30	3.5
20-Jul	8	11	11.0	12	south	flood	29.4	30	3.0
	7	11	10.4	8	south	high	30.5	46	4.0
	6.5	15	9.9	5	south	ebb	31.2	45	4.5
	6	13	9.8	5	south	ebb	31.3	46	9.0
	5	15	9.3	4	northeast	ebb	31.6	34	11.0
	4	15	9.7	5	northeast	ebb	31.7	23	12.0
21-Jul	4	11	9.5	20	northwest	ebb	31.4	24	9.0
	5	12	9.6	25	northwest	ebb	31.3	35	7.5
	6	12	9.8	3	northwest	ebb	31.2	46	7.0
	6.5	12	10.9	25	northwest	ebb	29.9	45	4.0
	7	13	10.8	25	northwest	flood	30.1	44	3.0
	8	15	10.9	27	northwest	flood	31.0	32	2.0
22-Jul	8	12	11.0	15	northwest	flood	29.4	30	3.0
	7	12	10.8	8	northwest	high	30.0	45	3.5
	6.5	13	9.6	15	northwest	ebb	31.7	44	9.0
	6	13	9.5	10	northwest	ebb	31.5	43	10.0
	5	13	9.5	10	northwest	ebb	31.5	35	10.0
	4	13	9.5	5	northwest	ebb	31.5	22	12.0
23-Jul	4	13	9.7	13	southeast	ebb	31.7	25	11.0
	5	13	11.1	20	southeast	ebb	29.6	32	4.0
	6	14	11.5	20	southeast	ebb	28.7	46	4.0
	6.5	13	11.6	2	south	low	28.8	43	3.0
	7	14	11.4	20	south	flood	29.0	40	3.0
	8	14	11.3	18	south	flood	29.3	32	3.0
24-Jul	8	13	11.8	10	south	flood	27.8	30	3.0
	7	13	10.2	5	south	flood	27.0	44	3.0
	6.5	13	12.2	5	south	flood	26.7	43	3.0
	6	14	11.5	5	southeast	flood	28.1	45	5.0
	5	13	9.6	0	none	high	31.7	34	14.0
	4	14	9.4	0	none	ebb	31.8	24	14.0

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Appendix F. (p 5 of 5)

Date	Station	Air Temp (c)	Water Temp (c)	Wind Vel. (knots)	Wind Dir	Tide Stage	Salinity (ppt)	Water Depth (f)	Secchi (m)
25-Jul	4	15	9.7	0	none	flood	31.3	24	14.0
	5	15	11.1	0	none	flood	29.3	34	7.0
	6	15	12.0	0	none	high	27.3	46	4.0
	6.5	18	12.1	0	none	ebb	27.6	42	3.5
	7	15	11.8	5	southwest	ebb	28.2	44	4.0
	8	17	11.6	5	southwest	ebb	28.8	30	4.0
26-Jul	8	14	12.5	5	northeast	ebb	26.5	29	3.0
	7	13	12.5	8	northwest	ebb	26.7	44	4.0
	6.5	13	11.1	5	northeast	low	29.9	42	5.5
	6	15	10.3	5	northeast	flood	30.9	46	9.0
	5	15	9.9	5	northeast	flood	31.3	34	13.0
	4	15	10.0	15	northwest	flood	31.4	25	13.0
27-Jul	4	19	10.1	10	southeast	flood	31.5	22	12.0
	5	18	10.1	8	southeast	flood	31.4	34	11.0
	6	17	11.0	5	southeast	flood	30.5	47	10.0
	6.5	18	11.9	10	southeast	high	28.0	42	5.0
	7	16	12.0	10	southwest	ebb	28.0	43	5.0
	8	17	12.2	8	southwest	ebb	28.0	29	5.0
28-Jul	8	14	12.7	5	south	ebb	26.4	23	4.0
	7	14	11.9	0	none	ebb	28.0	43	4.0
	6.5	15	11.3	5	southwest	ebb	29.1	42	5.0
	6	15	10.9	0	none	low	30.3	44	9.0
	5	15	9.9	10	south	flood	31.4	33	11.0
	4	14	10.2	0	none	flood	31.4	23	12.0
29-Jul	4	11	10.0	13	northwest	ebb	31.4	22	10.0
	5	14	10.0	15	northwest	low	31.2	34	10.0
	6	12	10.0	20	northeast	flood	31.0	44	6.0
	6.5	11	10.1	20	northwest	flood	30.9	42	5.0
	7	12	11.2	18	northwest	flood	28.9	42	3.0
	8	13	11.2	23	northwest	flood	29.0	30	3.0
30-Jul	8	11	11.3	5	northeast	flood	28.9	32	3.0
	7	13	11.0	10	northeast	high	29.2	44	3.0
	6.5	13	10.8	10	northeast	ebb	29.7	45	4.0
	6	13	11.0	10	northeast	ebb	29.0	40	4.5
	5	12	11.2	12	northeast	ebb	29.0	36	5.0
	4	13	10.1	15	northeast	ebb	31.8	23	8.0

Appendix G1. Total return estimates for sockeye salmon to Upper Cook Inlet, Alaska, made during the 2000 season.

Total Run Estimate Based on Offshore Test Fishing Information

Assume 15 July is mean 50% point of run across transect (On Time)
Fit of 2000 data to 1979-1999 data

You need to enter data only in cells with light gray shading.
You can sort the following list by MSS to rank estimates in order of best fit

		Estimated Total CPUE			
Year	MSS	Current	Previous Day	Difference	Timing
1979	0.01274	1,327	1,296	31	Early 5 days
1980	0.04472	1,121	1,076	45	Early 9 days
1981	0.04161	1,089	1,046	43	Early 9 days
1982	0.00247	2,321	2,317	3	Late 2 days
1983	0.00140	2,127	2,147	(20)	On Time
1984	0.00832	1,445	1,420	25	Early 4 days
1985	0.00397	2,026	2,011	15	On Time
1986	0.00252	2,130	2,129	1	Late 1 day
1987	0.00091	2,858	2,902	(44)	Late 2 days
1988	0.00597	1,706	1,685	21	Early 2 days
1989	0.01082	1,798	1,757	41	On Time
1990	0.00099	3,433	3,621	(189)	Late 3 days
1991	0.00088	2,560	2,611	(51)	Late 2 days
1992	0.00102	2,789	2,905	(116)	Late 2 days
1993	0.00213	1,864	1,868	(4)	Early 1 day
1994	0.00118	2,881	2,906	(25)	Late 4 days
1995	0.00105	2,042	2,075	(33)	On Time
1996	0.00131	1,714	1,727	(13)	Early 2 days
1997	0.00218	2,239	2,242	(3)	Late 1 day
1998	0.00294	2,450	2,446	4	Late 3 days
1999	0.00093	2,786	2,893	(108)	Late 3 days

TOTAL RUN THROUGH	17 Jul	2,121,423		
Escapement			713,504	
Above Sonar				595,438
Below Sonar				25,000
Unassessed (15% of total assessed)				93,066
Cumulative Catch			1,123,784	
Daily Drift				171,161
Daily Set				63,919
Residual in District			284,135	
Drift (40% expploitation, if full district; 25%, if reduced district)				256,742
Set (70% exploitation)				27,394
2000 cumulative cpue	959	through	15 Jul	
2000 cumulative cpue	1,149	through	17 Jul	

Appendix G1. (p 2 of 6)

Offshore Test Fishing Total Run Estimates for 2000

Passage Rate (Total Run/Cumulative CPUE) 1,846 Based on 17-Jul harvest
Total cpue for season, if 15 July is 50% point: 1,918

Run Estimate Based on Average Timing (15 July 50% Point) 3,541,244
Run Remaining 1,419,821

Run Estimates Based on Model Results (Fit of Current Year to Past Years)

		Estimated Total CPUE			Estimated		Run	
Year	MSS	Current	Previous Day	Difference	Total Run	Timing	Remaining	Mean/Day
1979	0.01274	1,327	1,296	31	2,450,530	Early 5 days	329,107	13
1980	0.04472	1,121	1,076	45	2,070,169	Early 9 days	(51,254)	(2)
1981	0.04161	1,089	1,046	43	2,010,496	Early 9 days	(110,927)	(4)
1982	0.00247	2,321	2,317	3	4,284,924	Late 2 days	2,163,501	84
1983	0.00140	2,127	2,147	(20)	3,927,864	On Time	1,806,441	70
1984	0.00832	1,445	1,420	25	2,667,399	Early 4 days	545,976	21
1985	0.00397	2,026	2,011	15	3,740,370	On Time	1,618,947	63
1986	0.00252	2,130	2,129	1	3,933,347	Late 1 day	1,811,924	70
1987	0.00091	2,858	2,902	(44)	5,276,564	Late 2 days	3,155,141	122
1988	0.00597	1,706	1,685	21	3,150,101	Early 2 days	1,028,678	40
1989	0.01082	1,798	1,757	41	3,319,575	On Time	1,198,152	46
1990	0.00099	3,433	3,621	(189)	6,338,014	Late 3 days	4,216,591	163
1991	0.00088	2,560	2,611	(51)	4,726,693	Late 2 days	2,605,270	101
1992	0.00102	2,789	2,905	(116)	5,149,685	Late 2 days	3,028,262	117
1993	0.00213	1,864	1,868	(4)	3,441,857	Early 1 day	1,320,434	51
1994	0.00118	2,881	2,906	(25)	5,320,027	Late 4 days	3,198,604	124
1995	0.00105	2,042	2,075	(33)	3,770,059	On Time	1,648,636	64
1996	0.00131	1,714	1,727	(13)	3,164,724	Early 2 days	1,043,301	40
1997	0.00218	2,239	2,242	(3)	4,134,449	Late 1 day	2,013,026	78
1998	0.00234	2,450	2,446	4	4,523,025	Late 3 days	2,401,602	93
1999	0.00093	2,786	2,893	(108)	5,143,075	Late 3 days	3,021,652	117

Total Run Estimate Based on Offshore Test Fishing Information

Assume 15 July is mean 50% point of run across transect (On Time)
Fit of 2000 data to 1979-1999 data

You need to enter data only in cells with light gray shading.
You can sort the following list by MSS to rank estimates in order of best fit

Year	MSS	Estimated Total CPUE Current	Previous Day	Difference	Timing
1979	0.01188	1,392	1,374	18	Early 5 days
1980	0.01301	1,226	1,195	31	Early 9 days
1981	0.04071	1,191	1,161	30	Early 9 days
1982	0.00220	2,272	2,295	(23)	Late 2 days
1983	0.00156	2,040	2,071	(31)	On Time
1984	0.00746	1,491	1,479	12	Early 4 days
1985	0.00339	2,019	2,028	(8)	On Time
1986	0.00224	2,087	2,107	(19)	Late 1 day
1987	0.00134	2,674	2,740	(66)	Late 2 days
1988	0.00513	1,730	1,727	3	Early 2 days
1989	0.00962	1,863	1,849	14	On Time
1990	0.00315	2,924	3,080	(156)	Late 3 days
1991	0.00154	2,381	2,442	(61)	Late 2 days
1992	0.00280	2,469	2,568	(99)	Late 2 days
1993	0.00193	1,826	1,841	(15)	Early 1 day
1994	0.00132	2,787	2,733	(55)	Late 4 days
1995	0.00155	1,934	1,969	(35)	On Time
1996	0.00132	1,670	1,685	(14)	Early 2 days
1997	0.00200	2,181	2,206	(25)	Late 1 day
1998	0.00209	2,394	2,420	(26)	Late 3 days
1999	0.00253	2,481	2,576	(95)	Late 3 days

TOTAL RUN THROUGH	20-Jul	2,452,927	
Escapement		1,022,939	
Above Sonar			839,512
Below Sonar			50,000
Unassessed (15% of total assessed)			133,427
Cumulative Catch		1,278,407	
Daily Drift			120,480
Daily Set			35,910
Residual in District		150,981	
Drift (40% expploitation, if full district; 25%, if reduced district)			135,720
Set (70% exploitation)			15,261
2000 cumulative cpu	959	through 15-Jul	
2000 cumulative cpu	1,297	through 20-Jul	

Offshore Test Fishing Total Run Estimates for 2000

Passage Rate (Total Run/Cumulative CPUE) 1,891 Based on 20-Jul harvest
Total cpue for season, if 15 July is 50% point: 1,918

Run Estimate Based on Average Timing (15 July 50% Point) 3,626,495
Run Remaining 1,174,167

Run Estimates Based on Model Results (Fit of Current Year to Past Years)

		Estimated Total CPUE			Estimated		Run	
Year	MSS	Current	Previous Day	Difference	Total Run	Timing	Remaining	Mean/Day
1979	0.01188	1,392	1,374	18	2,631,326	Early 5 days	178,999	7
1980	0.04301	1,226	1,195	31	2,318,177	Early 9 days	(134,150)	(5)
1981	0.04071	1,191	1,161	30	2,252,208	Early 9 days	(200,119)	(8)
1982	0.00220	2,272	2,295	(23)	4,295,316	Late 2 days	1,842,989	70
1983	0.00156	2,040	2,071	(31)	3,856,620	On Time	1,404,293	53
1984	0.00746	1,491	1,479	12	2,818,229	Early 4 days	365,902	14
1985	0.00339	2,019	2,028	(8)	3,818,143	On Time	1,365,816	52
1986	0.00224	2,087	2,107	(19)	3,946,848	Late 1 day	1,494,520	56
1987	0.00131	2,674	2,740	(66)	5,055,727	Late 2 days	2,603,400	98
1988	0.00513	1,730	1,727	3	3,270,444	Early 2 days	818,117	31
1989	0.00952	1,863	1,849	14	3,522,559	On Time	1,070,232	40
1990	0.00316	2,924	3,080	(156)	5,528,117	Late 3 days	3,075,789	116
1991	0.00154	2,381	2,442	(61)	4,502,148	Late 2 days	2,049,820	77
1992	0.00280	2,469	2,568	(99)	4,667,458	Late 2 days	2,215,130	84
1993	0.00193	1,826	1,841	(15)	3,453,262	Early 1 day	1,000,935	38
1994	0.00132	2,737	2,793	(55)	5,175,885	Late 4 days	2,723,558	103
1995	0.00155	1,934	1,969	(35)	3,657,522	On Time	1,205,195	46
1996	0.00132	1,670	1,685	(14)	3,158,170	Early 2 days	705,843	27
1997	0.0020	2,181	2,206	(25)	4,123,653	Late 1 day	1,671,326	63
1998	0.00209	2,394	2,420	(26)	4,527,011	Late 3 days	2,074,684	78
1999	0.00253	2,481	2,576	(95)	4,690,714	Late 3 days	2,238,387	85

Total Run Estimate Based on Offshore Test Fishing Information

Assume 15 July is mean 50% point of run across transect (On Time)
Fit of 2000 data to 1979-1999 data

You need to enter data only in cells with light gray shading.
You can sort the following list by MSS to rank estimates in order of best fit

		Estimated Total CPUE			
Year	MSS	Current	Previous Day	Difference	Timing
1979	0.01104	1,454	1,442	12	Early 5 days
1980	0.04073	1,330	1,309	21	Early 9 days
1981	0.03948	1,296	1,274	22	Early 9 days
1982	0.00237	2,172	2,200	(28)	Late 2 days
1983	0.00214	1,937	1,962	(25)	On Time
1984	0.00660	1,532	1,524	7	Early 4 days
1985	0.00300	1,975	1,990	(15)	On Time
1986	0.00282	2,010	2,031	(21)	Late 1 day
1987	0.00278	2,436	2,494	(57)	Late 2 days
1988	0.00429	1,735	1,736	(2)	Early 2 days
1989	0.00802	1,890	1,890	1	On Time
1990	0.00766	2,464	2,559	(95)	Late 3 days
1991	0.00313	2,181	2,227	(46)	Late 2 days
1992	0.00591	2,178	2,239	(61)	Late 2 days
1993	0.00188	1,779	1,792	(12)	Early 1 day
1994	0.00236	2,522	2,577	(54)	Late 4 days
1995	0.00227	1,834	1,856	(22)	On Time
1996	0.00126	1,639	1,646	(7)	Early 2 days
1997	0.00227	2,083	2,109	(26)	Late 1 day
1998	0.00234	2,279	2,311	(32)	Late 3 days
1999	0.00546	2,197	2,257	(60)	Late 3 days

TOTAL RUN THROUGH	24 Jul	2,769,548	
Escapement		1,168,850	
Above Sonar			991,391
Below Sonar			25,000
Unassessed (15% of total assessed)			152,459
Cumulative Catch		1,300,698	
Daily Drift			0
Daily Set			19,576
Residual in District		300,000	
Drift (40% expploitation, if full district; 25%, if reduced district)			0
Set (70% exploitation)			8,390
2000 cumulative cpu	959	through	15 Jul
2000 cumulative cpu	1,452	through	24 Jul

Appendix G1. (p 6 of 6)

Offshore Test Fishing Total Run Estimates for 2000

Passage Rate (Total Run/Cumulative CPUE) 1,907 Based on 24-Jul harvest
Total cpue for season, if 15 July is 50% point: 1,918

Run Estimate Based on Average Timing (15 July 50% Point) 3,658,397
Run Remaining 888,849

Run Estimates Based on Model Results (Fit of Current Year to Past Years)

		Estimated Total CPUE			Estimated		Run	
Year	MSS	Current	Previous Day	Difference	Total Run	Timing	Remaining	Mean/Day
1979	0.01104	1,454	1,442	12	2,773,687	Early 5 days	4,139	0
1980	0.04073	1,330	1,309	21	2,537,493	Early 9 days	(232,055)	(9)
1981	0.03948	1,296	1,274	22	2,472,489	Early 9 days	(297,059)	(11)
1982	0.00237	2,172	2,200	(28)	4,143,716	Late 2 days	1,374,169	51
1983	0.00214	1,937	1,962	(25)	3,695,305	On Time	925,758	35
1984	0.00660	1,532	1,524	7	2,921,262	Early 4 days	151,715	6
1985	0.0030	1,975	1,990	(15)	3,767,310	On Time	997,762	37
1986	0.00232	2,010	2,031	(21)	3,833,668	Late 1 day	1,064,120	40
1987	0.00278	2,436	2,494	(57)	4,647,270	Late 2 days	1,877,723	70
1988	0.00429	1,733	1,736	(2)	3,306,119	Early 2 days	536,571	20
1989	0.00802	1,890	1,890	1	3,605,200	On Time	835,652	31
1990	0.00766	2,464	2,559	(95)	4,700,220	Late 3 days	1,930,672	72
1991	0.00313	2,181	2,227	(46)	4,160,425	Late 2 days	1,390,878	52
1992	0.00591	2,178	2,239	(61)	4,154,894	Late 2 days	1,385,346	52
1993	0.00188	1,779	1,792	(12)	3,393,993	Early 1 day	624,445	23
1994	0.00236	2,522	2,577	(54)	4,810,964	Late 4 days	2,041,416	76
1995	0.00227	1,834	1,856	(22)	3,497,984	On Time	728,437	27
1996	0.00126	1,639	1,646	(7)	3,126,632	Early 2 days	357,085	13
1997	0.00227	2,083	2,109	(26)	3,973,557	Late 1 day	1,204,009	45
1998	0.00234	2,279	2,311	(32)	4,347,103	Late 3 days	1,577,555	59
1999	0.00546	2,197	2,257	(60)	4,189,742	Late 3 days	1,420,194	53

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